INTERNATIONAL SEARCH REPORT

Inte ıal Application No
PC[illegible]K 02/00419

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C12N15/10 C12P1/00 C12P19/34 C12P21/02 C07H21/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C12N C12P C07H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
WPI Data, PAJ, CAB Data, SEQUENCE SEARCH, BIOSIS, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	WO 02 074929 A (KANAN MATTEW W;GARTNER ZEV J ; LIU DAVID R (US); HARVARD COLLEGE () 26 September 2002 (2002-09-26) claims 1-46; figures 3,22-25 ---	1-232
X	WO 00 61775 A (SERGEEV PAVEL) 19 October 2000 (2000-10-19) the whole document ---	1-232
X	WO 00 23458 A (UNIV LELAND STANFORD JUNIOR) 27 April 2000 (2000-04-27) the whole document ---	1-232
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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
2 April 2003	25. 06. 2003

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	HORNIG H.

Form PCT/ISA/210 (second sheet) (July 1992)

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WALDER J A ET AL: "COMPLEMENTARY CARRIER PEPTIDE SYNTHESIS: GENERAL STRATEGY AND IMPLICATIONS FOR PREBIOTIC ORIGIN OF PEPTIDE SYNTHESIS" PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF USA, NATIONAL ACADEMY OF SCIENCE. WASHINGTON, US, vol. 76, no. 1, January 1979 (1979-01), pages 51-55, XP000857351 ISSN: 0027-8424 the whole document ---	1-232
X	VISSCHER J ET AL: "TEMPLATE-DIRECTED SYNTHESIS OF ACYCLIC OLIGONUCLEOTIDE ANALOGUES" JOURNAL OF MOLECULAR EVOLUTION, SPRINGER VERLAG, NEW YORK, NY, US, vol. 28, no. 1/2, 1988, pages 3-6, XP000857353 ISSN: 0022-2844 the whole document ---	1-232
X	KEILER K C ET AL: "ROLE OF A PEPTIDE TAGGING SYSTEM IN DEGRADATION OF PROTEINS SYNTHESIZED FROM DAMAGED MESSENGER RNA" SCIENCE, AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE,, US, vol. 271, 16 February 1996 (1996-02-16), pages 990-993, XP002041752 ISSN: 0036-8075 the whole document ---	1-232
X	SALAS J ET AL: "BIOSYNTHETIC POLYDEOXYNUCLEOTIDES AS DIRECT TEMPLATES FOR POLYPEPTIDE SYNTHESIS" JOURNAL OF BIOLOGICAL CHEMISTRY, THE AMERICAN SOCIETY OF BIOLOGICAL CHEMISTS, INC.,, US, vol. 243, no. 6, 1968, pages 1012-1015, XP000857332 ISSN: 0021-9258 the whole document ---	1-232
X	DE 196 46 372 C (EVOTEC BIOSYSTEMS GMBH) 19 June 1997 (1997-06-19) the whole document ---	1-232
A	WO 93 03172 A (UNIV RESEARCH CORP) 18 February 1993 (1993-02-18) cited in the application the whole document ---	

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	BRENNER S ET AL: "ENCODED COMBINATORIAL CHEMISTRY" PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF USA, NATIONAL ACADEMY OF SCIENCE. WASHINGTON, US, vol. 89, no. 12, 1 June 1992 (1992-06-01), pages 5381-5383, XP000647936 ISSN: 0027-8424 the whole document ---	
A	BRUICK R K ET AL: "TEMPLATE-DIRECTED LIGATION OF PEPTIDES TO OLIGONUCLEOTIDES" CHEMISTRY AND BIOLOGY, CURRENT BIOLOGY, LONDON, GB, vol. 3, no. 1, January 1996 (1996-01), pages 49-56, XP000856876 ISSN: 1074-5521 the whole document ---	
A	WO 98 56904 A (RIGEL PHARMACEUTICALS INC) 17 December 1998 (1998-12-17) the whole document ---	
A	BERGER MARKUS ET AL: "Universal bases for hybridization, replication and chain termination" NUCLEIC ACIDS RESEARCH, OXFORD UNIVERSITY PRESS, SURREY, GB, vol. 28, no. 15, 1 August 2000 (2000-08-01), pages 2911-2914, XP002194275 ISSN: 0305-1048 cited in the application the whole document -----	

INTERNATIONAL SEARCH REPORT

ıational application No.
PCT/DK 02/00419

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-232,236 (complete); 237-242,244-253,265-289,292,296-306 (partially)

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-232, 236, (237-242, 244-253, 265-289, 292, 296-306)-partially

A method for synthesising a template molecule comprising a plurality of functional groups, said method comprising the steps of i) providing at least one template comprising a sequence of n coding elements, wherein each coding element comprises at least one recognition group capable of recognising a predetermined complementing element, and wherein n is an integer of more than 1, ii) providing a plurality of building blocks, wherein each building block comprises a) at least one complementing element comprising at least one recognition group capable of recognising a predetermined coding element, b) at least one functional entity comprising at least one functional group and at least one reactive group, and c) at least one linker separating the at least one functional entity from the at least one complementing element, iii) contacting each of said coding elements with a complementing element capable of recognising said coding element, iv) optionally, obtaining a complementing template, and v) obtaining a template molecule comprising covalently linked, functional groups by linking, by means of a reaction involving reactive groups, a functional group of at least one functional entity to a functional group of another, functional entity, wherein the templated molecule is capable of being linked by means of a linker to the complementing template or template that template the synthesis of the template molecule, and wherein the synthesis of the templated molecule does not involve ribosome mediated translation of a nucleic acid;

2. Claims: 233, (237-242, 244-253, 265-289, 292, 296-306)-partially

A template molecule comprising a sequence of covalently linked, functional groups, wherein the template molecule does not comprise or consist of an a-peptide or a nucleotide;

3. Claims: 234, (237-242, 244-253, 265-289, 292, 296-306)-partially

A template molecule comprising a sequence of covalently linked, functional groups, wherein the template molecule does not comprise or consist of a monosubstituted a-peptide or a nucleotide;

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

4. Claims: 235, (237-242, 244-253, 265-289, 292, 296-306)-partially

A template molecule comprising a sequence of covalently linked, functional groups, wherein the template molecule does not comprise or consist of a peptide or a nucleotide;

5. Claim : 243

A complex comprising a template molecule and the template that template the synthesis of the template molecule;

6. Claims: 254, (265-289, 292, 296-306)-partially

A template molecule comprising a sequence of covalently linked, functional groups, wherein the template molecule is linked by means of a linker to the complementing template or template that template the synthesis of the template molecule, wherein the template molecule does not comprise or consist of an alpha-peptide;

7. Claims: 255, (265-289, 292, 296-306)-partially

A template molecule comprising a sequence of covalently linked, functional groups, wherein the template molecule is linked by means of a linker to the complementing template or template that template the synthesis of the templated molecule, wherein the template molecule does not comprise a monosubstituted a-peptide;

8. Claims: 256, (265-289, 292, 296-306)-partially

A template molecule comprising a sequence of covalently linked, functional groups, wherein the templated molecule is linked by means of a linker to the complementing template or template that template the synthesis of the template molecule, wherein the template molecule does not comprise or consist of an a-peptide or a nucleotide;

9. Claims: 257, (265-289, 292, 296-306)-partially

A template molecule comprising a sequence of covalently linked, functional groups, wherein the template molecule is linked by means of a linker to the complementing template or template that template the synthesis of the template molecule, wherein the template is not a natural nucleotide, when the template molecule is an a-peptide;

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

10. Claims: 258, (265-289, 292, 296-306)-partially

A template molecule comprising a sequence of covalently linked, functional groups, wherein the template molecule is linked by means of a linker to the complementing template or template that template the synthesis of the template molecule, wherein the template does not consist exclusively of natural nucleotides, when the template molecule is a peptide comprising exclusively monosubstituted a-amino acids;

11. Claims: 259, (265-289, 292, 296-306)-partially

A template molecule comprising a sequence of covalently linked, functional groups, wherein the template molecule is linked by means of a linker to the complementing template or template that template the synthesis of the template molecule, wherein the template is not a natural nucleotide, when the template molecule is a natural a-peptide;

12. Claims: 260, (265-289, 292, 296-306)-partially

A template molecule comprising a sequence of covalently linked, functional groups, wherein the template molecule is linked by means of a linker to the complementing template or template that template the synthesis of the template molecule, wherein the template is not a nucleotide, when the template molecule is a natural a-peptide;

13. Claims: 261, (265-289, 292, 296-306)-partially

A templated molecule comprising a sequence of covalently linked, functional groups, wherein the template molecule is linked by means of a linker to the complementing template or template that template the synthesis of the template molecule, wherein the template is not a nucleotide, when the template molecule is a monosubstituted a-peptide;

14. Claims: 262, (265-289, 292, 296-306)-partially

A template molecule comprising a sequence of covalently linked, functional groups, wherein the template molecule is linked by means of a linker to the complementing template or template that template the synthesis of the template molecule, wherein the template is not a nucleotide, when the template molecule is an a-peptide;

15. Claims: 263, (265-289, 292, 296-306)-partially

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

A template molecule comprising a sequence of covalently linked, functional groups, wherein the template molecule is linked by means of a linker to the complementing template or template that template the synthesis of the template molecule, wherein the template is not a natural nucleotide, when the template molecule is a peptide;

16. Claims: 264, (265-289, 292, 296-306)-partially

A template molecule comprising a sequence of covalently linked, functional groups, wherein the template molecule is linked by means of a linker to the complementing template or template that template the synthesis of the template molecule, wherein the template is not a nucleotide, when the template molecule is a peptide;

17. Claims: 290, (292, 296-306)-partially

A molecule comprising a sequence of covalently linked building blocks, wherein the sequence of covalently linked building blocks comprises a sequence of complementing elements forming a complementing template capable of complementing the template that template the synthesis of the template molecule, and wherein the template molecule is linked to the complementing template or template that template its synthesis;

18. Claims: 291, (292)-partially

A templated molecule according to any of the previous claims, wherein the templated molecule comprises a sequence of functional entities comprising at least one functional group, and optionally at least one reactive group type 11, and wherein each functional entity is linked to a complementing element or a template that template the synthesis of the templated molecule;

19. Claim : 293

A method for screening template molecules potentially having a predetermined activity, said method comprising the step of providing a target molecule or a target entity, including a surface, and obtaining template molecules having an affinity for-or an effect on-said target molecule or target entity;

20. Claim : 294

A method for assaying an activity potentially associated with a template molecules, said method comprising the step of providing a target molecule or a target entity, including

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

a surface, and obtaining template molecules having an affinity for-or an effect on-said target molecule or target entity, and determining the activity of the templated molecule;

21. Claim : 295

A method for selecting complexes or template molecules having a predetermined activity, said method comprising the step of performing a selection procedure and selecting templated molecules based on predetermined selection criteria;

22. Claim : 307

A method for amplifying the complementing template or the template that template the synthesis of the templated molecule having, or potentially having a predetermined activity, said method comprising the step of contacting the template with amplification means, and amplifying the template;

23. Claim : 308

A method for amplifying the complementing template or the template that template the synthesis of the templated molecule having, or potentially having, a predetermined activity, said method comprising the steps of i) contacting the template with amplification means, and amplifying the template, and ii) obtaining the templated molecule in an at least two-fold increased amount;

24. Claim : 309

A method for altering the sequence of a templated molecule, including generating a template molecule comprising a novel or altered sequence of functional groups, wherein said method preferably comprises the steps of i) providing a first complementing template or a first template capable of templating the first templated molecule, or a plurality of such first com plementing templates or first templates capable of templating a plurality of first template molecules, ii) mutating or modifying the sequence of the first complementing template or the first template, or the plurality of first complementing templates or first templates, and generating a second template or a second comple menting template, or a plurality of second templates or second comple menting templates, wherein said second template (s) or complementing template (s) is capa ble of templating the synthesis of a second template molecule, or a

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

plurality of second template molecules, wherein said second template molecule (s) comprises a sequence of covalently linked, functional groups that is not identical to the sequence of functional groups of the first template molecule(s), and optionally iii) templating by means of said second template(s) or complementing tem plate (s) a second template molecule, or a plurality of such second tem plated molecules;

25. Claims: 310-313

A method for altering the sequence of a template molecule, including generating a template molecule comprising a novel or altered sequence of functional groups, wherein said method preferably comprises the steps of i) providing a plurality of first complementing templates or first templates capable of templating a plurality of first template molecules, ii) recombining the sequences of the plurality of first complementing tem plates or first templates, and generating a second template or a second complementing template, or a plurality of second templates or second complementing templates, wherein said second template(s) or complementing template(s) is capable of templating the synthesis of a second template molecule, or a plu rality of second templated molecules, wherein said second template molecule(s) comprises a sequence of covalently linked, functional groups that is not identical to the sequence of functional groups of the first template molecule(s), and optionally iii) templating by means of said second template (s) or complementing tem plate (s) a second template molecule, or a plurality of such second templated molecules;

26. Claims: 314-316

A building block comprising i) a complementing element capable of specifically recognising a coding element having a recognition group, said complementing element being selected from nucleotides, amino acids, antibodies, antigens, proteins, peptides, and molecules with nucleotide recognizing ability, ii) at least one functional entity selected from a precursor of a-peptides, p- peptides, y-peptides, w-peptides, mono-, di-and tri-substituted a-peptides, p-peptides, y-peptides, o-peptides, peptides wherein the amino acid residues are in the L-form or in the D-form, vinylogous polypeptides, glycopoly-peptides, polyamides, vinylogous sulfonamide peptide, polysulfonamide, conjugated peptides comprising e. g. prosthetic groups, polyesters, polysaccharides, polycarbamates, polycarbonates, polyureas, polypeptidylphosphonates, polyurethanes, azatides, oligo N-substituted glycines, polyethers, ethoxyformacetal oligomers, poly-thioethers, polyethylene glycols (PEG), polyethylenes, polydisulfides, polyarylene

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

sulfides, polynucleotides, PNAs, LNAs, morpholinos, oligo pyrrolinone, polyoximes, polyimines, polyethyleneimines, polyimides, polyacetals, polyacetates, polystyrenes, polyvinyl, lipids, phospholipids, glycolipids, polycyclic compounds comprising e. g. aliphatic or aromatic cycles, including polyheterocyclic compounds, proteoglycans, and polysiloxanes, and iii) a linker separating the functional entity from the complementing element;

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mation on patent family members

Inte nal Application No
PCT/UK 02/00419

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 02074929 A	26-09-2002	WO 02074929 A2	26-09-2002
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PA 2002 00415 15 March 2002 (15.03.2002) DK

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(72) Inventors; and

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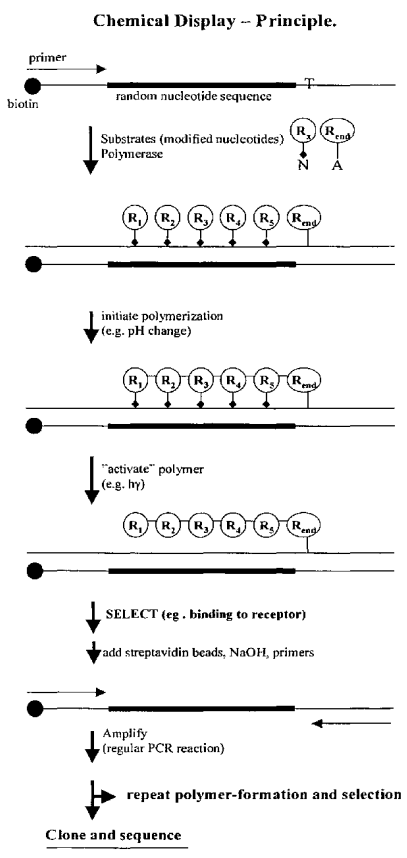
[Continued on next page]

(54) Title: TEMPLATED MOLECULES AND METHODS FOR USING SUCH MOLECULES



(57) Abstract: The present invention relates to a method for synthesising templated molecules. In one aspect of the invention, the templated molecules are linked to the template which templated the synthesis thereof. The intion allows the generation of libraries which can be screened for e.g. therapeutic activity.

WO 02/103008 A3

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(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.